

NOTEWORTHY COLLECTIONS

ARIZONA

DACTYLOCTENIUM RADULANS (R. Br.) P. Beauv. (POACEAE) [button grass].—Pima Co., Marana, ca. 20 km NNW of Tucson, Continental Ranch community and the adjacent floodplain (west bank) of the Santa Cruz River, Sonoran desertscrub on farmland fallow for over 10 yr, summer ephemeral occurring in low areas and drainages on silty-clay substrate. Locally common around a mudhole on floodplain, with *Atriplex polycarpa*, *Bouteloua aristoides*, *B. barbata*, *Chloris virgata*, and *Pennisetum ciliare*, 32°21'45.5"N, 111°06'35.7"W, elev. 648 m, 9 Sept 2006, J.F. Wiens 2006-157 (ARIZ, ASDM). Rare near the top of concrete embankment of the Santa Cruz River, with *Bouteloua aristoides*, *B. barbata*, *Chloris virgata*, *Eragrostis echinochloidea*, *Isoetia tenuisecta*, *Larrea divaricata*, *Panicum coloratum*, *Pennisetum ciliare*, and *Prosopis velutina*, 32°22'07.3"N 111°06'43.1"W, elev. 646 m, 9 Sept 2006, J.F. Wiens 2006-160 (ARIZ, ASDM). Locally abundant along shallow drainage on the floodplain, with *Atriplex polycarpa*, *Chloris virgata*, *Larrea divaricata*, *Pennisetum ciliare*, and *Prosopis velutina*, 32°22'10.2"N 111°06'50.4"W, 641 m, 9 Sept 2006, J.F. Wiens 2006-162 (ARIZ, ASDM). Rare in concrete-sided drainage within the community, with *Bouteloua aristoides*, *Eragrostis lehmanniana*, and *Sorghum halepense*, 32°22'18.4"N, 111°08'09.6"W, elev. 640 m, 24 Sept 2006, M.F. Hanson 2006-01 (ARIZ). Rare in concrete-sided drainage within the community, with *Bouteloua aristoides*, *Cynodon dactylon*, *Eragrostis lehmanniana*, and *Prosopis velutina*, 32°23'08.9"N, 111°07'36.6"W, elev. 636 m, 24 Sept 2006, M.F. Hanson 2006-02 (ASDM). Locally common in concrete-sided drainage within the community, near Silverbell and Cortaro Farms Rds., with *Amaranthus palmeri*, *Bouteloua aristoides*, *Chloris virgata*, *Dactyloctenium aegyptium*, and *Eragrostis lehmanniana*, 32°20'59.1"N, 111°06'05.0"W, elev. 651 m, 25 Sept 2006, J.F. Wiens 2006-183 (ARIZ, ASU, UT, US, ASDM), det. J. R. Reeder. Rare (solitary plant) found on a graded site 12 km WSW of Tucson (on Eagle Cove Drive, just E of the intersection of AZ Hwy. 86 and W. Valencia Rd.), with *Prosopis velutina*, *Pennisetum ciliare*, *Chloris virgata*, and *Salsola tragus*, 32°08'15.5"N, 111°07'58.0"W, elev. 750 m, 30 Aug 2007, C. Hemingway 2007-01 (ASDM).

Previous knowledge. *Dactyloctenium radulans* is native to tussock grasslands to open-woodland areas of New South Wales and Queensland in Australia. In agricultural areas of that region it is found as a weed in pastures and along irrigation ditches and roads (Queensland Environmental Protection Agency, 2003, Regional Ecosystems of the Desert Uplands; http://www.epa.qld.gov.au/media/nature_conservation/biodiversity/desert_uplands/Factsheets/100901.htm). Three U.S. collections from 1957 to 1960 were from Jamestown, Berkeley Co., South Carolina (*H.E. Ahles 30800, 35612, 53777*, MASS). These were all from the waste ground surrounding the Santee Wool Combing Mill on SC Rte #45 (K.B. Searcy, MASS, personal communication). This fits a likely introduction scenario, in that the seed could easily have been transported in wool imported from Australia (J.R. Reeder, personal com-

munication). The USDA website (<http://plants.usda.gov/java/profile?symbol=DARA2>) mentions its occurrence (authors unable to confirm) in Massachusetts and Florida. The only previous Arizona specimens were from cultivated greenhouse stock at the Plant Materials Center (Southwest Nurseries, Soil Conservation Service, U.S. Department of Agriculture) formerly on the University of Arizona campus, Tucson (*A.R. Purchase A-751*, 11 July 1939, and *J. Burrell s.n.*, 12 Sept 1959, ARIZ). The Burrell collection label reads "Introduced in 1933, as plant introduction no. 106469, from Australia, now established at Plant Material Center, Tucson." The current manager of the Arizona Plant Materials Center, USDA – NRCS in Tucson (now located near Campbell Road and the Rillito Wash) finds no archival mention of the species ever being at the PMC, although early records are incomplete (R. Garner, personal communication).

Significance. First collections of wild plants in the western United States. The two earlier Arizona collections were from cultivated plants in a nursery (no longer existing), and the species has not been seen in Arizona for over 40 yr. An extensive search of similar habitat 20 km upstream from the 2006 collection sites on the Santa Cruz River, and two major tributaries, the Rillito Wash and the Cañada del Oro as well as likely habitat for 85 km downstream, yielded no additional *D. radulans*. Channelized washes draining the southern Tucson Mountains through the Continental Ranch area were checked thoroughly. The survey led us to believe *D. radulans* was contained within the Continental Ranch neighborhood and adjacent Santa Cruz floodplain, an area of ca. 790 ha, bounded on the west by Silverbell Rd. (Hanson 2006-01), the south by Cortaro Rd. (Wiens 2006-183), an un-named, side drainage to the north (Hanson and 2006-02), and the east by the Santa Cruz River (Wiens 2006-160). There *D. radulans* seems to prefer shallow washes where seasonal floodwaters move slowly and don't scour the substrate. Due to the many sites within the neighborhood, *D. radulans* must have been present locally for at least one season previous to summer 2006, although not observed until this year. It appears not to be particularly competitive with other plant species, especially perennial grasses, but its seed are likely spread by mechanical disking that is used for weed control in the neighborhood drainages. The Hemingway (2007-01) collection came from the Brawley Wash watershed (running parallel to the Santa Cruz River Watershed), approximately 45 km SSE of the 2006 Wiens and Hanson collections. Due to the discovery of this plant on a disturbed construction site so far from the larger population, we feel it may have been introduced to this area via dirty grading equipment. We see no reason that it could not spread to favorable river floodplain habitat, agricultural fields, and construction sites in both watersheds.

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CALIFORNIA

CALOCEDRUS DECURRENS (Torrey) Florin (CUPRESSACEAE).—San Diego Co., Bucksnot Mountain, two seedlings that established after a wildfire in 2003 were located on a concave west-facing slope of 13°, at the uppermost extent of an unnamed drainage, at an elevation of 1820 m, about 350 m S of Combs Peak on the Bucksnot Mountain USGS 7.5 min topographic quadrangle, NW 1/4 NE 1/4, Sec. 18, T 9 S, R 4 E, San Bernardino Base Meridian, 33°23'29"N 116°36'18"W, 23 March 2007, Goforth & Minnich s.n. (UCR).

Previous knowledge. Extensive field mapping across the southern California Peninsular range in the Vegetation Type Map (VTM) survey (Griffin and Critchfield 1976, Research Paper PSW-82, U.S. Forest Service) and subsequent searches using aerial photography (Minnich and Everett 2001, Madroño 49:177–197) recorded *C. decurrens* on the San Jacinto Mountains, Palomar Mountain, Hot Springs Mountain, Volcan Mountain, and the Cuyamaca-Laguna Mountains. *C. decurrens* was not known to occur on Bucksnot Mountain (Beauchamp 1986, A flora of San Diego County, California, Sweetwater River Press).

Significance. This is the first collection of *C. decurrens* from Bucksnot Mountain, documenting long-distance seed dispersal and successful establishment at a site burned in July 2003 (3 growing seasons prior to the collection). The nearest stands occur on the summits of Hot Springs Mountain (10 km S), Palomar Mountain (25 km W) and Santa Rosa Mountain (30 km NE; Minnich and Everett 2001, *loc. cit.*). Intervening basins and mountains separating these widely disjunct stands are covered by chaparral, southern oak woodland, nonnative annual grassland, and creosote brush scrub.

The seedlings of *C. decurrens* were discovered 9 m apart while surveying stands of fire-killed *Pinus coulteri* D. Don at Bucksnot Mountain. They were 24.0 cm and 25.5 cm in height, with basal diameters of 4.0 mm and 5.0 mm. Subsequent ground searches across Bucksnot Mountain failed to detect additional seedlings, or a parent tree.

Bucksnot Mountain (1880 m) is the highest coastal range mountain in southern California lacking mixed conifer forest, and is arid (average annual precipitation ~40 cm) due to its rain-shadowed position NE of Palomar Mountain. Summit locations only support stands of *P. coulteri*, while Hot Springs Mountain located south of the Palomar Mountain rainshadow has mixed conifer forest at the same elevation (Minnich and Everett 2001, *loc. cit.*). Soils are derived from colluvium of weakly-metamorphosed granitic rock, with an A horizon having sandy-loam texture. Associated species include abundant seedlings of *P. coulteri* (350 ha⁻¹) in a fire-killed stand with 310 trees ha⁻¹, as well as *Arctostaphylos glandulosa* Eastw., *Ceanothus leucodermis* E. Greene, *Quercus chrysolepis* Liebm., *Rhamnus californica* ssp. *tomentella* (Benth.) C.B. Wolf, *Solidago californica* Nutt., and *Turricula parryi* (A. Gray) J.F. Macbr.

Colonization of Bucksnot Mountain by *C. decurrens* was facilitated by wildfire and subsequent near-record rainfall. The 2003 burn cleared dense shrub cover which diminished evapotranspiration and exposed bare min-

eral soil for germination. The 2004–2005 winter season was one of the wettest on record (~250% of normal rainfall).

We believe on the basis of chance that a cone was dispersed to the site rather than individual seeds. *C. decurrens* usually has 4 fertile seeds per cone, and the lightweight cones are small (<2.5 cm in length; Hickman 1993, *The Jepson Manual: Higher Plants of California*, University of California Press, Berkeley, CA). We speculate that seed was dispersed to the site after the fire by a bird that could carry a seed cone, such as a Scrub Jay, Nuttall's Woodpecker, or Raven. It is doubtful that strong winds could carry winged seed to Bucksnot Mountain from the nearest stand. It is also unlikely that the seedlings were planted because the site is far from the nearest road or trail.

A species distribution may expand if seed dispersal results in successful establishment of new outlying populations (Sauer 1988, *Plant Migration: The Dynamics of Geographic Patterning in Seed Plant Species*, University of California Press, Berkeley, CA). However, events of long-distance plant migration as this collection documents are rarely witnessed. The seedlings have survived a most hazardous phase of their ontogeny, i.e., establishment, and it is possible they will grow to reproductive maturity. Since many *P. coulteri* trees at Combs Peak exhibit basal fire scars, indicating survival of past wildfire, mature *C. decurrens* trees could also endure such burn events at the site, and perhaps reproduce subsequent generations. On the other hand, colonization may fail if the seedlings die due to the site's aridity or a future stand-replacement fire; in which case, their establishment would illustrate how plant distributions are maintained in equilibrium between an inherent tendency to disperse and constraining environmental conditions.

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CALIFORNIA

CAREX LONGII MACK. (CYPERACEAE).—Shasta Co., along the north side of Rt. 299, about 100 ft W. of the intersection with Jim Harvey Road and about 3.8 mi E. of the Interstate-5 overpass. Elev. 650 ft. 40°37'35.5"N, 122°17'36.1"W. UTM 10 559765E, 4497541N (NAD83/WGS84). Uncommon herbs to 2 ft tall, growing in mud along a small seasonal creek and moist swale in an open woodland on loamy soil (Redding gravelly loam, 0 to 3% slopes; fine, mixed, active, thermic Abruptic Durixeralfs), with *Aira caryophylla*, *Anthoxanthum aristatum*, *Avena barbata*, *Briza maxima*, *B. minor*, *Bromus secalinus*, *Cyperus eragrostis*, *Dichelostemma* sp., *Eleocharis macrostachya*, *Eryngium articulatum*, *Glyceria occidentalis*, *Juncus tenuis*, *Lolium multiflorum*, *Mimulus guttatus*, *Odontostomum hartwegii*, *Pinus sabiniana*, *Quercus douglasii*, *Q. wislizenii*, *Rumex crispus*, *Taeniatherum caput-medusae* & *Trifolium hirtum*. 16 May 2005, D. Goldman 3316 (BH, GH, MICH, OSC, UC).

The site was revisited during the dry season in late July 2005 and the following species were also found: *Hypericum perforatum*, *Lactuca serriola*, *Lotus purshianus*, *Mentha pulegium*, and *Paspalum dilatatum*.